

REMARKS

Status of claims

Claims 1-13 are pending. Claim 1 has been amended.

Overview of the Office Action

Claims 1, 2, 5, 6 and 11 stand rejected as obvious under 35 USC 103(a) by Murphy, published U.S. Patent Application No. 2002/0112068, in view of Sandler, U.S. Patent No. 5,608,734.

Claims 3, 4, 12, and 13 stand rejected as obvious under 35 USC 103(a) by Murphy, in view of Fussgager, U.S. Patent No. 5,050,952.

Claim 7 was rejected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Descriptive summary of the invention

The following summary is based upon the specification. It is provided only for the convenience of the Examiner, and is not intended to argue limitations which are unclaimed.

As illustrated in FIGs. 1a and 1b and described in the specification at least on page 5, lines 31-33, the present invention enables bidirectional optical communication between a central unit 10 and a remote unit 20. Illustratively, the central unit 10 is utilized at a telecommunications service provider, whereas the remote unit 20 is utilized by a client subscriber of the telecommunications service provider. Communication is enabled with knowledge that the remote unit 20 is using a communication mode which is one of a plurality of possible communication modes in which the central unit 10 is capable of operating.

Initially, the central unit 10 has no information on which specific communication mode the remote unit 20 is using (see page 3, lines 12-21). Possible communication modes include a simultaneous communication mode, such as simplex, full-duplex, or diplex, or an alternating communication mode, such as half-duplex or part-duplex (page 4, lines 7-14).

Prior to setting up communication between the central unit 10 and the remote unit 20, the central unit must determine the communication mode used by the remote unit. This determination process is based upon a recognition that only one respective frame pattern, illustratively selected from a set of frame pattern variants having the same header cell as the one frame pattern, is compatible with each of a plurality of corresponding communication modes, such as simplex, full-duplex, half-duplex, diplex, part-diplex, and wavelength division multiplexed (WDM). Examples of suitable frame patterns are shown in FIGs. 2a-2c. The central unit 10 sends a plurality of frame patterns to the remote unit 20, such that each of respective frame patterns corresponds to a specific communication mode. The frame patterns are sent sequentially until a coherent response is obtained from the remote unit 20. The communication mode of the remote unit 20 is the mode which corresponds to the frame pattern which gave rise to the coherent response. Accordingly, by sending a sequence of defined frame patterns, and then receiving a coherent response from the remote unit 20 in response to one of the defined frame patterns, the central unit 10 is able to identify the corresponding communication mode used by the remote unit 20 (see page 3, lines 22-31).

Some key aspects of the claimed invention include the following:

1. Two-way communication is set up between a central unit and a remote unit.
2. The central unit sends a plurality of frame patterns sequentially to the remote unit.
3. A communication mode is selected by the central unit if it elicits a coherent response (as defined on page 8, lines 31-36) from the remote unit.

The claimed invention is patentable over Murphy and Sandler

The Examiner contends that, under 35 USC 103(a), claims 1, 2, 5, 6, and 11 are unpatentable over Murphy (U.S. Patent Application Publication No. 2002/0112068 A1) in view of Sandler (U.S. Patent No. 5,608,734). More specifically, the Examiner argues that FIGs. 3 and 4 of Murphy disclose the claimed invention except for sequentially sending a plurality of frame patterns until a coherent response is received. The Examiner relies upon Sandler, U.S. Patent No. 5,608,734 to supply this missing limitation, reasoning that it would have been obvious to one skilled in the art to use Murphy's frame detection mechanism in combination with Sandler's sequential transmission of frames.

Murphy addresses the problem of communicating with a new device that has been inserted into a computer network (page 1, paragraphs 0005 and 0006). Initially, the new device does not know what frame patterns are supported by the computer network. Accordingly, the new device embeds a SAP (service advertising protocol) request into each of a plurality of different frame types, and issues these requests on the network (FIG. 3, step 305, par. 0036). The new device checks to see whether any responses to these requests have been received within a predetermined period of time (step 310). The new device makes a list of all frame types for which responses have been received within the predetermined period of time (step 315), and one of the listed frame types is then selected (step 360). This selection process is performed by presenting the list of frame types to a user and permitting a device user to select a frame type from the list (page 4, paragraph 0047). Alternatively, the device is programmed with a particular preferred ordering of frame types, and will select one of the listed frame types that is most preferred (page 4, paragraph 0048).

Murphy is lacking insofar as the present invention is concerned for at least the following reasons:

1. Murphy does not disclose setting up two-way communication between a central unit and a remote unit. Par. 0005 of Murphy mentions "data ... received via the network ...". See also par. 0031 which refers only to "a receiving device." The Examiner's reference to "two-way optical communication between a first unit (410) and a second unit (420)" and the specific reliance on par. 0054 of Murphy are not understood by the undersigned because Murphy says absolutely nothing about two-way communication therebetween.

2. As the Examiner correctly observed, Murphy neither teaches nor suggests sequential transmission of predefined frame patterns. However, it is also noteworthy that Murphy does not disclose sending the plurality of frame patterns sequentially from the central unit to the remote unit. In Murphy, the new device is analogous to the remote unit of the present invention. It is this new device that is active to get itself set up on the network. In contrast, the present invention relies on the central unit for this task.

3. Murphy does not select a communication mode on the condition that it elicits a coherent response (as defined on page 8, lines 31-36 of the present specification) from the remote unit to one of a plurality of frame patterns. Instead, Murphy embeds a SAP request and the response elicited is to that specific request.

The Examiner reliance upon the Sandler patent addresses (albeit inadequately) only the second above-listed shortcoming of Murphy. However, even if the teachings of Murphy and Sandler and Murphy are combined, the resulting combination fails to meet applicants' invention as set forth in claim 1. Sandler provides a method and an apparatus for framing data in digital communication systems. A framing apparatus 30 (FIG. 5) is capable of recognizing any one of a number of predetermined framing formats created by framing information. A successive sequence of frame patterns are transmitted for recognition purposes (col. 7, lines 1-10). Yet,

Sandler does not disclose or even suggest that a frame pattern is selected from the transmitted sequence based upon receipt of a coherent response, nor that this could be used for setting up two-way communication. Accordingly, claim 1 is not obvious in view of the combination of Murphy and Sandler.

Since all of the remaining claims depends, either directly or indirectly, from independent claim 1, it is submitted that each is allowable therewith.

The claimed invention is patentable over Murphy and Fussgager

The Examiner contends that, under 35 USC 103(a), claims 3, 4, 12, and 13 are unpatentable over Murphy in view of Fussgager, U.S. Patent No. 5,050,952. Regarding claims 3 and 4, the Examiner alleges that the combination of Murphy and Fussgager discloses applicant's claimed invention "wherein the communication modes comprise duplex, and duplex modes". In reaching this conclusion, the Examiner reasons that Fussgager's use of the term "duplex" (Fussgager, col. 2, lines 5-10) is understood to cover all variants of duplex transmission. Regarding claims 12 and 13, the Examiner states that Murphy does not disclose "wherein the remote units are distinguished by wavelength, and the step of sending the plurality of frame patterns sequentially is performed in succession at each remote unit wavelength for each frame pattern until a coherent response is obtained". The Examiner alleges that Fussgager discloses transmission between stations over multiple wavelengths, and reasons that it would have been obvious to one of ordinary skill in the art to use the Murphy frame detection scheme over a multi-wavelength system.

It is noted that claims 3 and 4 depend from claim 2, whereas claims 12 and 13 depend from claim 1. Since claims 1 and 2 were rejected over Murphy in view of Sandler, perhaps the Examiner

intended to reject claims 3, 4, 12, and 13 over Murphy in view of Sandler, and further in view of Fussgager.

The teachings of Murphy have been described above in connection with the Examiner's obviousness rejection of claim 1. Fussgager discloses an optical communication system for diplex or duplex transmission. Two signals are transmitted with different fiber modes at two different wavelengths, either unidirectionally or bidirectionally, via a single waveguide. If one of the two wavelengths is above the cutoff wavelength of a coupler waveguide, and the other wavelength is below the cutoff wavelength of a coupler waveguide, fusion couplers with exactly similar fibers are used as multiplexers, demultiplexers, and duplexers. If both wavelengths are below the cutoff wavelength of the coupler waveguide, fusion couplers with dissimilar fibers are used as multiplexers, demultiplexers, and duplexers.

Even if the teachings of Fussgager are combined with the other two reference, the resulting combination fails to obviate the claimed invention because Fussgager does not bridge the above-discussed gap between the claimed invention and Murphy. Accordingly, claims 3, 4, 12 and 13 are allowable.

Patentable subject matter

Claim 7 was objected to as being dependent upon a rejected base claim, but the Examiner indicated that this claim would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, since claim 1 is allowable for the reasons discussed above, claim 7 will be retained in dependent form.

Conclusion

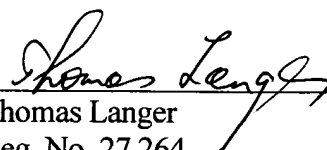
Based on the foregoing considerations, it is respectfully submitted that the present invention as set forth in claims 1-13 is clearly and patentably distinguishable over the applied references. Accordingly, prompt and favorable action leading to allowance of the present application is respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, he is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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